

WESTERN SYDNEY
UNIVERSITY



Module 2

Discovering Functions

HELP feature

- MATLAB has many built-in functions – difficult to remember all
- MATLAB has an indexed library of its built-in functions that you can access through the **help** feature.
- If you type help in the command window MATLAB provides a list of help topics.
- Can use help **function**
 - e.g. help **cos**

Other methods

- Press F1 for documentation or type 'doc **function name**'. This is much more detailed than 'help' and often shows examples of the functions use
 - e.g. doc **rand** or doc **sin**
- Google search when function name is not known



square root matlab



from www.mathworks.com

sqrt

Square root

Syntax

`B = sqrt(X)`

`B = sqrt(X)` returns the **square root** of each element of the array `X`. For the elements of `X` that are negative or complex, `sqrt(X)` produces complex results.

www.mathworks.com > ... > Exponents and Logarithms

[Square root - MATLAB sqrt - MathWorks](#)

Help – from Command Window

The image shows two MATLAB Command Window instances and a Help Documentation window. The top-left Command Window shows the command `help sqrt` and its output: `sqrt` Square root. `sqrt(X)` is the square root of `X`. Results are produced if `X` is a scalar, vector, or matrix. See also [sqrtnm](#), [realsqrt](#). [Reference page for sqrt](#). [Other functions named sqrt](#).

The bottom-left Command Window shows the command `doc sqrt`.

The Help Documentation window is titled "Documentation" and shows the "sqrt" function page. The left sidebar contains a navigation menu with the following items: `CONTENTS` (Close), `All Products`, `MATLAB`, `Mathematics`, `Elementary Math`, `Exponents and Logarithms`, `MATLAB`, and `Functions`. The main content area displays the following information:

sqrt

Square root

Syntax

```
B = sqrt(X)
```

Description

`B = sqrt(X)` returns the square root of each element of the array `X`. If `X` is negative or complex, `sqrt(X)` produces complex results.

The `sqrt` function's domain includes negative and complex numbers. Results are produced if used unintentionally. For negative and complex numbers `z`, the square root `sqrt(z)` returns

$$\sqrt{r}(\cos(\phi/2) + 1i\sin(\phi/2))$$

where $r = \text{abs}(z)$ is the radius and $\phi = \text{angle}(z)$ is the phase angle, $-\pi \leq \phi \leq \pi$.

If you want negative and complex numbers to return error messages instead of results, use `realsqrt` instead.

Examples

The image shows the MATLAB R2016a interface. The top ribbon includes tabs for HOME, PLOTS, APPS, EDITOR, PUBLISH, and VIEW. The Command Window is active, showing a prompt `>>`. The Command History window is open, displaying a list of commands executed, including `clc`, `help(sqrt)`, and `clc`. The workspace is empty.

HOME PLOTS APPS EDITOR PUBLISH VIEW

New Script New Open Compare Import Data Save Workspace New Variable Open Variable Analyze Code Run and Time Clear Workspace Simulink Layout Preferences Set Path Add-Ons Help Community Request Support

FILE VARIABLE CODE SIMULINK ENVIRONMENT RESOURCES

d: \ Users \ Upul \ Documents \ MATLAB

Current Folder

- Name
- Cone.m
- mexican_hat.m

Editor - Untitled

- Cone.m
- mexican_hat.m
- Untitled

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Command Window

```
>> |
```

Workspace

Name	Value
------	-------

Command History

```
R=5  
C=10  
L=4  
E=2  
w=2  
x1=R^2+(2*pi*w*L-1...  
E/sqrt(x1)  
24/02/2017 10:...  
clc  
- help(sqrt)  
clc  
help sqrt  
clc
```

Exercise

- Use MATLAB help to find the exponential, natural logarithm, and logarithm base 2 functions.
- Calculate e^7 `exp(7)`
- Calculate $\ln(4)$ `log(4)`
- Calculate $\log_2(12)$ `log2(12)`
- Calculate $\log_{10}(1.56)$ **`log10(1.56)`**

Discrete-mathematics functions

`factor(10)`

`rats(4.2)`

`factorial(3)`

`gcd(20,10)`

`lcm(4,6)`

- What do these functions do?
- If you are not sure, use the help feature.